

Amendments to the Claims

Claim 1 (Currently Amended): A purified and isolated nucleotide sequence said nucleotide sequence having at least 80% homology to the sequence of SEQ ID NO:6 which encodes upon expression a regulatory protein characterized by the following:

- (a) is approximately 45 kD;
- (b) is expressed natively under heat shock conditions;
- (c) is localized in chloroplasts;

~~said nucleotide sequence being capable of hybridizing to SEQ ID NO:6 under conditions equivalent to hybridizing for 12 hours at 42°C in a buffer containing 50% formamide, 5 X SSPE, 2% SDS, 10 X Denhardt's solution, and 100 µg/ml salmon sperm DNA, and washing with 0.1 X SSC, 0.1% SDS at 55°C.~~

- (d) wherein expression of said protein increases heat and drought tolerance in plants.

Claim 2 (Cancelled).

Claim 3 (Previously presented): An expression construct comprising:  
a nucleotide sequence according to claim 1, operatively linked to a regulatory region that directs expression of a protein in a plant cell.

Claim 4 (Original): A vector capable of transforming or transfecting a host cell, said vector comprising an expression construct according to claim 3.

Claim 5 (Original): The vector of claim 4 wherein said vector is a plasmid based vector.

Claim 6 (Original): The vector of claim 4 wherein said vector is a viral based vector.

Claim 7 (Currently amended): A ~~prokaryotic or eukaryotic~~ bacterial or plant host cell transformed or transfected with a vector according to claim 4.

Claim 8 (Cancelled).

Claim 9 (Withdrawn): A regulatory protein which exhibits the following characteristics:

- (a) is approximately 45 kD;
- (b) is expressed primarily under heat shock conditions;
- (c) is localized in plant chloroplasts;
- (d) has high homology (80% or greater) to chloroplast elongation factor EF-Tu, from *E coli* or tobacco and comprises at least 80% amino acid sequence homology to SEQ ID NOS:1, 2, 3 or 4.

Claim 10 (Withdrawn): The protein of claim 9 wherein said protein comprises SEQ ID NO:1.

Claim 11 (Withdrawn): The protein of claim 9 wherein said protein comprises SEQ ID NO:2.

Claim 12 (Withdrawn): The protein of claim 9 wherein said protein comprises SEQ ID NO:3.

Claim 13 (Withdrawn): The protein of claim 9 wherein said protein comprises SEQ ID NO:4.

Claim 14 (Currently Amended): A method for increasing plant tolerance to heat and drought comprising:

transforming a plant cell with a genetic construct comprising:

a nucleotide sequence which encodes a regulatory protein characterized by the following:

- (a) is approximately 45 kD;
- (b) is expressed natively under heat shock conditions;
- (c) is localized in chloroplasts;

said nucleotide sequence being operably linked to promoter and regulatory regions capable of

inducing expression in a transgenic plant or plant tissue; and

regenerating a transgenic plant from said transformed cells wherein expression of said protein in the transgenic plant increases heat and drought tolerance.

Claim 15 (Original): The method of claim 14 wherein said expression construct elements cause expression during stress.

Claim 16 (Original): The method of claim 14 wherein said promoter is selected from the group consisting of: a constitutive, an inducible, and an organ specific promoter.

Claim 17 (Cancelled).

Claim 18 (Original): The method of claim 14 wherein said expression construct further comprises a selectable marker gene.

Claim 19 (Withdrawn): A method of identifying heat shock EF-Tu genes in plant species comprising:  
screening the genome of said plant species for a sequence that is homologous to SEQ ID NO:5 or a region of at least 100 bases thereof.

Claim 20 (Cancelled).

Claim 21 (Previously presented): A transgenic plant containing a DNA construct comprising:  
a polynucleotide encoding EF-Tu operably linked to a promoter, wherein said polynucleotide is expressed so that the plant exhibits tolerance to one or more conditions selected from the group consisting of excess heat and drought, wherein said resistance is not present in a corresponding plant not containing the DNA construct.

Claim 22 (Cancelled).

Claim 23 (Previously presented): A seed produced by the transgenic plant of claim 21 wherein said seed comprises said DNA construct.

Claim 24 (Original): A progeny transgenic plant derived from the transgenic plant of claim 21 wherein said progeny plant expresses said DNA construct so that the progeny plant exhibits said tolerance.

Claim 25 (Original): A transgenic plant according to claim 21 wherein the plant is a maize plant.

Claim 26 (Original): A seed derived from the progeny plant of claim 24 wherein said seed comprises the DNA construct.

Claim 27 (Previously presented): A transgenic plant according to claim 21 wherein the plant is obtained by a process comprising the steps of:  
bombarding intact regenerable plant cells with microprojectiles coated with the DNA construct;  
identifying or selecting a population of transformed cells; and  
regenerating a transgenic plant therefrom.

Claim 28 (Original): A method of increasing the tolerance of a plant to heat or drought, comprising:  
introducing into cells of a plant an expression cassette comprising a preselected DNA segment encoding EF-Tu, to yield transformed plant cells; and

regenerating a plant from said transformed cells, wherein the EF-Tu is expressed in the cells of the plant so as to render the transformed plant substantially tolerant to drought or excess heat that inhibits the cell metabolism, growth, or development of an untransformed plant.

Claim 29 (Previously presented): A method according to claim 28 further including the step of obtaining progeny from said transformed plant wherein said progeny comprises said DNA construct.

Claim 30 (Original) A method according to claim 29 wherein the progeny are obtained by crossing the transformed plant with an inbred line.

Claim 31 (Original) A method according to claim 29 further including the step of: obtaining seed from the progeny and obtaining further progeny plants comprising the DNA construct from the seed.